

WHAT IS CLAIMED IS:

1. A conductive roller comprising at least one conductive elastic layer,

said conductive elastic layer formed of a polymer composition comprising:

a main-component polymer not containing chlorine nor bromine and containing polyether or/and a cyan group; and

an anion-containing salt having a fluoro group and a sulfonyl group,

wherein said anion-containing salt having said fluoro group and said sulfonyl group includes at least one salt selected from among a salt of bisfluoroalkylsulfonylimide, a salt of fluoroalkylsulfonic acid, and a salt of tris (fluoroalkylsulfonyl) methide.

2. The conductive roller according to claim 1, wherein said polymer containing said polyether or/and said cyan group is contained in said polymer composition at not less than 20 wt% nor more than 90 wt% of an entire polymer component of said polymer composition.

3. The conductive roller according to claim 2, wherein said polymer composition contains a low polar ozone-resistant rubber in addition to said polymer containing said polyether or/and said cyan group.

4. The conductive roller according to claim 2, wherein as said polymer having said cyan group, one or more polymers

are used selectively from among acrylonitrile butadiene rubber (NBR), hydrogenated acrylonitrile butadiene rubber, carboxyl-modified acrylonitrile butadiene rubber, acrylonitrile butadiene isoprene terpolymer (NBIR), and liquid nitrile rubber; and

as said low polar ozone-resistant rubber, one or more rubbers are used selectively from among ethylene propylene rubber (EPM), ethylene-propylene-diene terpolymer (EPDM), styrene-butadiene copolymer rubber (SBR), butyl rubber (IIR), and silicone rubber (Q).

5. The conductive roller according to claim 1, wherein EPDM is used as said low polar ozone-resistant rubber; and said EPDM is contained at 10 wt% to 80 wt% of an entire polymer component of said polymer composition.

6. The conductive roller according to claim 1, containing carbon black as a filler.

7. The conductive roller according to claim 1, wherein an electric resistance value of said conductive roller measured by applying a voltage of 1000V thereto at a temperature of 23°C and a relative humidity of 55% is set to not less than $10^4\Omega$ nor more than $10^9\Omega$;

when said voltage of 1000V is applied to said conductive roller, a ratio of a maximum value of an electric resistance of said conductive roller in a circumferential direction thereof to a minimum value of said electric resistance thereof

in said circumferential direction is set to not more than 1.3;

when an electric resistance value $R(\Omega)$ of said conductive roller is measured at a temperature of 10°C and a relative humidity of 15% and at a temperature of 32.5°C and a relative humidity of 90% by applying said voltage of 1000V thereto, a value of an equation of $\Delta \log_{10}R = \log_{10}R$ (electric resistance value at temperature of 10°C and relative humidity of 15%) - $\log_{10}R$ (electric resistance value at temperature of 32.5°C and relative humidity of 90%) is set to not more than 1.4; and

a difference between a common logarithm of an electric resistance value of said conductive roller measured by applying a voltage of 100V thereto at a temperature of 23°C and a relative humidity of 55% and a common logarithm of an electric resistance value measured by applying a voltage of 5000V thereto at a temperature of 23°C and a relative humidity of 55% is set to not more than 0.5.

8. The conductive roller according to claim 1, wherein a ratio of an electric resistance value of said conductive roller six seconds after a constant voltage of 1000V is applied thereto to an electric resistance value thereof at a time when said constant voltage of 1000V is applied thereto at a temperature of 10°C and a relative humidity of 15% is set to not less than 100% nor more than 105%.

9. The conductive roller according to claim 1, wherein

said conductive elastic layer has a compression set not more than 35%, when said compression set is measured at a temperature of 70°C for 24 hours at a compressibility ratio of 25% in accordance with the method of testing permanent strain of vulcanized rubber and thermoplastic rubber specified in JIS K6262; and said conductive elastic layer has a hardness not more than 70 degrees, when said hardness is measured by a durometer of type E specified in JIS K6253.

10. The conductive roller according to claim 1, wherein said conductive elastic layer formed of said polymer composition comprising a rubber component, composing a main component of said polymer composition, consisting of a mixture of ethylene-propylene-diene terpolymer (EPDM) and acrylonitrile butadiene rubber (NBR); not less than 0.01 parts by weight nor more than 20 parts by weight of said anion-containing salt having said fluoro group and said sulfonyl group added to 100 parts by weight of said rubber component; and a chemical foaming agent to foam said polymer composition, and

said conductive foamed elastic layer has a compression set not more than 30%, when said compression set is measured at a temperature of 70°C for 24 hours at a compressibility ratio of 25% in accordance with the method of testing permanent strain of vulcanized rubber and thermoplastic rubber specified in JIS K6262.

11. The conductive roller according to claim 10, wherein a weight ratio between said ethylene-propylene-diene terpolymer and said acrylonitrile butadiene rubber is 75:25 to 20:80.

5 12. The conductive roller according to claim 10, wherein said chemical foaming agent is azodicarbonamide (ADCA) and/or 4,4'-oxybis (benzene sulfonyl hydrazide) (OBSH);

not less than three parts by weight nor more than 12 parts by weight of said chemical foaming agent is added to 100 parts by weight of said rubber component; and

urea is used as a foaming assistant; and not less than three parts by weight nor more than 12 parts by weight of said foaming assistant is added to 100 parts by weight of said rubber component.

15 13. The conductive roller according to claim 1, wherein a chemical foaming agent is added to a mixture of acrylonitrile butadiene rubber (NBR) having a bound acrylonitrile amount at not more than 25%, ethylene-propylene-diene terpolymer (EPDM), and polyethylene oxide-polypropylene oxide-allyl glycidyl ether terpolymer (PO-EO-AGE terpolymer)

20 to foam said mixture.

14. A conductive roller according to claim 13, wherein said NBR, said EPDM, and said PO-EO-AGE copolymer are mixed with one another at not less than 50 parts by weight nor more

25 than 80 parts by weight, at not less than 0.5 parts by weight

nor more than 30 parts by weight, and at not less than 0.5 parts by weight nor more than 30 parts by weight respectively for 100 parts by weight of said mixture; and

not less than 0.5 parts by weight nor more than two
5 parts by weight of said anion-containing salt having said fluoro group and said sulfonyl group is added to 100 parts by weight of said mixture.

15. An image-forming apparatus having a conductive roller according to claim 1.